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A BILATERAL GYNANDROMORPHIC XYLOCOPA TAKEN IN CALIFORNIA (HYMENOPTERA: APIDAE)

GORDON GORDH

Systematic Entomology Laboratory, IIBIII, Agr. Res. Serv., USDA, c/o U.S. National Museum, Washington, D.C. 20560

and

HANIF GULMAHAMAD

Division of Biological Control, Department of Entomology, University of California, Riverside, California 92502

ABSTRACT—Comparative morphology and notes on foraging behavior of a bilateral gynandromorphic carpenter bee, *Xylocopa brasilianorum varipuncta* Patton, taken in California are provided. The specimen is compared with a bilateral gynandromorphic *X. nigrita* Fabricius from Africa.

Because gynandromorphs are seemingly rare and of interest to many entomologists, attention is drawn to a large gynandromorphic carpenter bee *Xylolopa brasilianorum varipunta* Patton taken in California. The gynandromorphic specimen is described in detail so that students of the phenomenon may conduct comparative studies. Each side (Right-female; Left-male) is described separately.

DESCRIPTIVE COMMENTS

Female: Head convex in frontal aspect (fig. 1); entire head except malar area with umbilicate punctations; parocular area and posterior margin of vertex densely hairy; frons, genal, and malar areas sparsely hairy; clypeus moderately hairy; labrum with long thick hairs along clypeolabral margin; scrobe slightly hairy. Ocelli symmetrically placed; ocellocular distances nearly equal. Mandible bidentate (fig. 4), polished black except amber outer margin from posterior articulation to imaginary transverse line bisecting mandible. Maxilla black except amber outer margin and proximal flange. Maxillary palpus 6 segmented; stipes mostly black, apically amber; labial palpus apparently 4 segmented. Antenna (fig. 5) 12 segmented, black except amber apex of scape and pedicel.

Mesosoma (fig. 2) black, densely hairy except glabrous central region of scutellum; anterior margin of propodeum yellow with yellow hairs.

Metasoma uniformly black and typically female.

Legs uniformly black; tarsal claws and orbiculae similar on all legs (fig. 7).

Fig. 1, Head, frontal aspect. Fig. 2, Body, dorsal aspect.

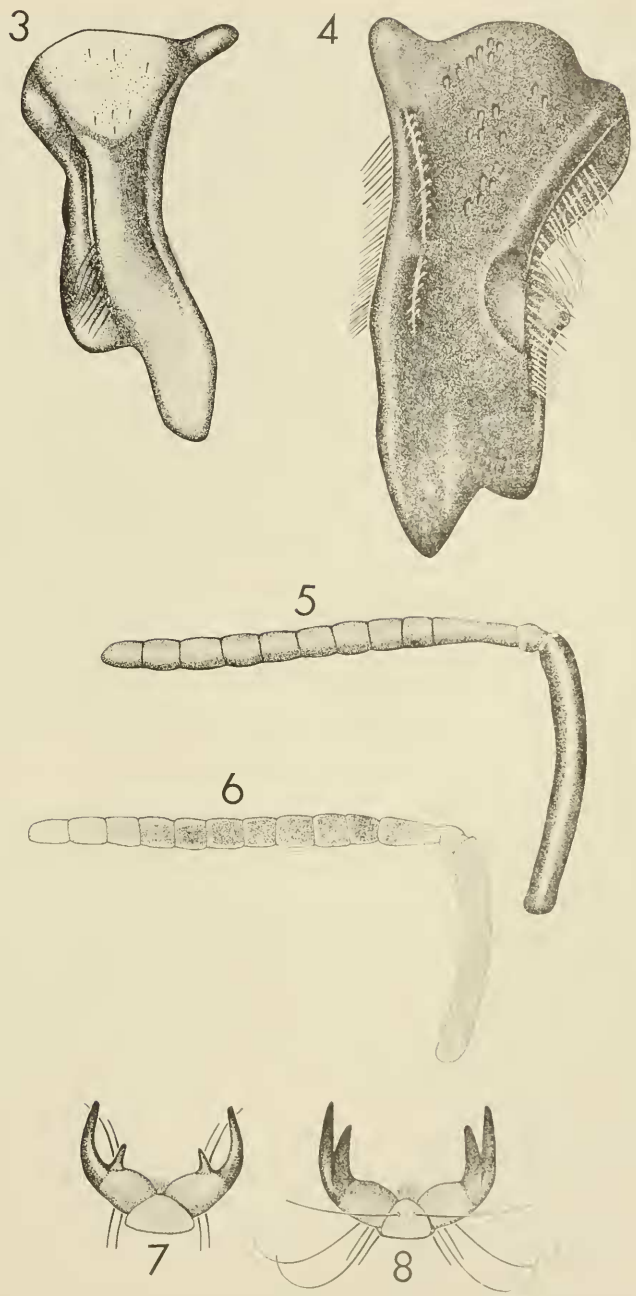

Fig. 3, Male mandible, outer aspect. Fig. 4, Female mandible, outer aspect. Fig. 5, Female antenna, frontal surface aspect. Fig. 6, Male antenna, posterior surface aspect. Fig. 7, Female hind tarsal claws and orbicula. Fig. 8, Male hind tarsal claws and orbicula.

Male: Resembling the female except in the following details: vertex concave; parocular area, mandible base, genal area yellow; scrobe amber; parocular, genal, preoccipital areas with yellow setae. Mandible (fig. 3) bidentate, shorter than female mandible and inner tooth truncate; outer margin, apex amber with body blackish. Maxilla shorter than for female, yellowish except amber inner and outer margins and median carina. Antenna (fig. 6) 13 segmented, predominantly yellow except posterior aspect of scape and flagellar segments 1–8, which are dark brown, but progressively less so distally.

Mesosoma (fig. 2) yellow with yellow hairs (pilosity corresponding to that of female) on scutum, scutellum, metanotum; propodeum nearly all yellow except small transverse black strip along anterior margin; ventral portion of mesepimeron black with black hairs.

Metasomal tergum 1 yellow along lateral ⅔, remainder black; tergum 2 nearly all black except yellow anteromesal stripe that extends posteriorly along midline and does not reach posterior tergal margin; extreme lateral and mesal portion of tergum 3 black, remainder yellow; tergum 4 uniformly yellow; tergum 5 mesally yellow, laterally black; tergum 6 with small yellow mesal longitudinal stripe. Sterna uniformly black and undifferentiated from female portion of sterna.

Legs predominantly yellow except following: fore femur uniformly dark along inner surface and anterobasal portion and fore trochanter; middle femur, trochanter and coxa black except yellow beneath apex of femur; hind coxa, trochanter, femur black, brush of hairs along ventral surface of tibia and basitarsus black.

Wings of both sides similar in size; forewings with a little uniform wear; female wings distinctly more smoky.

Genitalia apparently female on both sides; sheaths (valvulae 3) of equal length and setosity; lancet complete, apparently normal; bulb asymmetrical with female side convex, male side concave giving the bulb an appearance of a bent tube.

Observations on Foraging Behavior

Despite the morphological peculiarities mentioned, the gynandromorphic specimen did not appear to have difficulty taking nectar from flowers of *Parkinsonia aculeata* L. (palo-verde). The tree was in partial bloom at the time the specimen was taken (14 August 1973). Three other carpenter bees, apparently normal females of the same species were also foraging on the flowers. The gynandrous specimen was first observed at about 10 feet above the ground foraging on the flowers. It was well out of reach of a standard insect net and thus was observed as it moved from flower to flower. The specimen visited 5 or more flowers before it was captured. Its behavior did not in any visible way differ from that of the normal females which were foraging for nectar on the same tree. No pollen collecting behavior was observed because the specimen did not attempt to collect pollen from the tree. The scopa, when examined in the laboratory, did not contain pollen. Judging from the wings of the specimen, it would appear the individual was relatively young as little wear was apparent. It is quite possible, however, that this bee would have gathered pollen from flowers of other plant species later in life

although some difficulty could be anticipated due to the absence of a scopa on the left metathoracic leg.

Carcasson (1965) has noted the existence of a bilateral gynandromorphic *X. nigrita* Fabricius collected near Kerocho, Kenya, Africa. Both gynandromorphs have several features in common: both are nearly perfect bilateral gynandromorphs with the left side male and the right side female; both have a black apical gastral tergum. The female portion of terga 1 and 2 of Carcasson's specimen has white hairs whereas the California specimen has some black hairs mesally on tergum 1; tergum 2 is nearly all black and the third tergum is mesally black on the male side. Carcasson reported the genitalia of his specimen were normal (female).

The California specimen is deposited in the P. H. Timerlake collection at the University of California, Riverside.

Reference

Carcasson, R. H. 1965. A remarkable gynandrous carpenter bee. J. E. Afr. Nat. Hist. Soc. 25:75.

KEY TO THE GENERA OF SCIOMYZIDAE (DIPTERA) FROM THE AMERICAS SOUTH OF THE UNITED STATES, WITH DESCRIPTIONS OF TWO NEW GENERA

C. C. Steyskal and L. Knutson
Systematic Entomology Laboratory, IIBIII, Agr. Res. Serv., USDA[1]

ABSTRACT—A key is presented to the genera of Sciomyzidae (Diptera) known from the Americas south of the United States including two new genera, **Eutrichomelina** Steyskal (proposed for *Sciomyza fulvipennis* Walker) and **Calliscia** Steyskal (proposed for *Pherbellia callisceles* Steyskal).

Existing keys to the genera of snail-killing flies (Sciomyzidae) from the Americas south of the United States (e.g., Malloch, 1933) are incomplete and out of date. The key presented below includes all genera to be included in the chapter on Sciomyzidae in the catalogue of South American Diptera (Knutson, *et al.*, in press).

Two new genera are described in the key: *Eutrichomelina* Steyskal, for *Sciomyza fulvipennis* Walker; and *Calliscia* Steyskal, for *Pherbellia callisceles* Steyskal. The key also includes the monotypic genus *Pseudomelina* Malloch, based on characters given in the original description. The male holotype of *Pseudomelina apicalis* Malloch (from Puerto Montt, Chile) apparently is not in the British Museum (N.H.), and no other specimens are known to us. The tribal placement of *Pseudomelina*, as discussed by Kaczynski, *et al.* (1969), is in question.

It should also be noted that several genera included in the key are primarily North American taxa that are not known to occur south of the Isthmus of Panama (*Antichaeta*, *Atrichomelina*, *Euthycera*, *Hoplodictya*, *Sepedon* and *Tetanocera*). References to keys to species are noted for each genus, where pertinent.

1. Propleural bristle present (Sciomyzini, plus *Perilimnia* and *Shannonia* [Tetanocerini]) 2
— Propleural bristle absent, only fine hairs on propleuron (Tetanocerini, plus *Pseudomelina* [Sciomyzini]) 8
2. Propleural bristle short and fine, only slightly larger than propleural hairs; nearly entire meso- and sternopleuron, center of pteropleuron, and upper posterior edge of hind coxa with fine hairs; fore tarsus with basitarsus white, distal 4 segments black (*A. pubera* (Loew)) .... *Atrichomelina* Cresson
— Propleural bristle long and coarse or if short and fine (*Shannonia*) then without the above combination of characters 3
3. Anal vein of wing not reaching margin; wing vein R_1 not extending apicad of anterior crossvein; 2 pairs of dorsocentral bristles; anterior pair very

[1] Mail address: c/o U. S. National Museum, Washington, D. C. 20560.

strong and at suture; arista short pubescent; palpus with 1 strong apical bristle; cheeks very narrow; shiny black or brown species (Malloch, 1933, as *Dichrochirosa*) ..... *Parectinocera* Becker

— Anal vein of wing reaching margin, although weakly in some species; without the above combination of characters 4

4. Four pairs of dorsocentral bristles, (1 antesutural and 3 ad- and postsutural); midfrontal stripe very short, tomentose; wing vein R_1 extending apicad of anterior crossvein (*Sciomyza fulvipennis* Walker, generitype, and *Melina albibasis* Malloch; gender feminine) ..... *Eutrichomelina* Steyskal, new genus

— Two or three pairs of dorsocentral bristles, none antesutural 5

5. Three pairs of dorsocentral bristles; mesopleural bristle present; sternopleural bristles absent; midfrontal stripe scarcely extending beyond ocellar triangle; 1 pair of fronto-orbital bristles; wing hyaline (*Pherbellia callisceles* Steyskal, generitype; gender feminine) .. *Calliscia* Steyskal, new genus

— Two or three pairs of dorsocentral bristles; both mesopleural and sternopleural bristles present or both absent or only sternopleurals present 6

6. Second aristal segment about as long as wide; 3rd antennal segment rather short, rounded apically; 1 or 2 pairs of fronto-orbital bristles; sternopleural bristles present or absent; mesopleuron with or without hairs, without bristles; wing patterned or not ..... *Pherbellia* Robineau-Desvoidy

— Second aristal segment 3–5 times longer than wide; 3rd antennal segment rather elongate and tapered apically; 2 pairs of fronto-orbital bristles (anterior pair sometimes small in *Perilimnia*); sternopleural bristles present; mesopleural bristle present or absent; wing hyaline 7

7. Propleural bristle large; anterior orbital bristles smaller than posterior orbitals; 1 mesopleural bristle; male 4th abdominal sternum with short, dense, black spinules along posterior margin (Kaczynski, *et al.*, 1969) .... *Perilimnia* Becker

— Propleural bristle small; anterior orbital bristles well developed, almost as long and strong as posterior oribtals; no mesopleural bristles; male 4th abdominal sternum without short, dense, black spinules along posterior margin (Kaczynski, *et al.*, 1969) ..... *Shannonia* Malloch

8. Third antennal segment broadly rounded apically as in *Pherbellia*; pteropleuron with 1 or 2 bristles or bristly hairs; hind coxa without bristles or hairs above base of femur; 2 pairs of postsutural dorsocentral bristles (*P. apicalis* Malloch) ..... *Pseudomelina* Malloch

— Without the above combination of characters 9

9. Vallar (subalar) bristles present 10

— Vallar bristles absent 11

10. Arista with sparse blackish hairs; lunule covered; face without black central spot (Steyskal, 1974) ..... *Dictyodes* Malloch

— Arista densely white-pubescent; lunule broadly exposed; face with black central spot (Steyskal, 1950, 1953) ..... *Protodictya* Malloch

11. Ocellar bristles well developed; 4 scutellar bristles 12

— Ocellar bristles small and weak or lacking; 2 scutellar bristles 20

12. Hind tibia with 2 dorsal preapical bristles (Fisher and Orth, 1971) ..... *Antichaeta* Haliday

— Hind tibia with 1 or no dorsal preapical bristles 13

13. Arista with white pubescence or hairs; wing with strong pattern 14
— Arista with black pubescence or hairs; wing with or without pattern 16
14. Lunule exposed only mesally, between antennae; 2nd antennal segment about half as long as 3rd (Malloch, 1933) ..... *Euthycerina* Malloch
— Lunule broadly exposed; 2nd antennal segment at least almost as long as 3rd segment, sometimes much longer 15
15. 2nd antennal segment about as long as 3rd; head about as long as high (*E. mira* Knutson and Zuska) ..... *Euthycera* Latreille
— 2nd antennal segment much longer than roundish 3rd segment; head at least 1.5 times as long as high (Steyskal, 1960) ..... *Teutoniomyia* Hennig
16. Meso- and pteropleuron without bristles or hairs; if hairs present on posterior part of mesopleuron then wing without dense pattern 17
— Meso- and sometimes pteropleuron with bristles or hairs; wing with dense pattern 18
17. Sternopleuron with hairs only; arista long-haired to plumose (Steyskal, 1959) ..... *Tetanocera* Duméril
— Sternopleuron with 2 strong bristles; 0 or 1 presutural dorsocentral bristles, 3 or 4 postsuturals; arista with short pubescence (Zuska and Berg, 1974) ..... *Tetanoceroides* Malloch
18. Fronto-orbital bristles 2; 1 strong sternopleural bristle; face without black central spot (Fisher and Orth, 1972) ..... *Hoplodictya* Cresson
— Fronto-orbital bristle 1; sternopleural bristle lacking; face with or without black central spot 19
19. Face with black central spot; body with many dark spots at bases of hairs and otherwise (Steyskal, 1954, 1960) ..... *Dictya* Meigen
— Face without black central spot; body largely plain tawny (*G. straminata*, (Wulp)) ..... *Guatemalia* Steyskal
20. Sternum closed above hindcoxae; lower head drawn out into conical rostrum into which proboscis may be withdrawn; palpus not developed; postocellar and usually fronto-orbital bristles lacking; pleural sclerites without hairs or bristles, except a few hairs on propleuron close above forecoxa ..... *Thecomyia* Perty
— Sternum above hindcoxae divided by membranous area; lower head not forming tube into which proboscis may be withdrawn; palpus well developed; postocellars present or absent; 1 or 2 pairs of fronto-orbital bristles; pleura frequently with numerous hairs 21
21. Postocellar bristles absent; 1 pair of fronto-orbital bristles; midfemur with minute bristles or setae, none of which is distinctly larger than the others; hind femur almost twice as long as abdomen (Steyskal, 1951) ..... *Sepedomerus* Steyskal
— Postocellar bristles well developed; 0, 1, or 2 pairs of fronto-orbital bristles; midfemur with 1 or more distinctly larger anterior setae near its midlength; hind femur only about ⅓ longer than abdomen 22
22. Face with black spot in each lower corner; forefemur with at least 1 outstanding dorsal bristle; male with surstyli fused along median line (Steyskal, 1951) ..... *Sepedonea* Steyskal
— Face without spots in lower corners; forefemur without outstanding dorsal bristle; male with surstyli well separated on median line (Steyskal, 1951) ..... *Sepedon* Latreille

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We thank K. R. Valley for informing us of his capture of a new species of *Antichaeta* from Mexico, and for allowing us to study his material. We also thank J. Abercrombie, C. O. Berg, A. D. Bratt, T. W. Fisher, B. A. Foote, R. E. Orth, and K. R. Valley for reviewing this manuscript.

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NORTH AMERICAN SPECIES OF THE GENUS BRACHYPODA (ACARINA: ATURIDAE: AXONOPSINAE)[1]

David R. Cook
Wayne State University, Detroit, Michigan 48202

ABSTRACT—The North American members of the water mite genus *Brachypoda* Piersig are treated and 2 species, *B.* **fimbricaudata** and *B.* **affinis**, are described as new.

Four species of *Brachypoda* Piersig (and an additional subspecies) have been previously described by Herbert Habeeb from North America. These are: *B. cornipes cornipes*, *B. cornipes owascoa*, *B. setosicaudata*, *B. acuticaudata* and *B. oakcreekensis*. The type-material on which these species were based has been privately retained and all recent attempts to borrow the specimens have been unsuccessful. The previous descriptions and illustrations are lacking in critical detail but, with the exception of *cornipes* and its subspecies, the recollection of specimens at or near the type locality has made identification reasonably certain.

Species diagnoses are based primarily on morphology of the male, especially shape of the cauda and structure of the genital field region. Females, with two known exceptions, are so similar that they cannot be identified to species with certainty. Identification of females based on correlation with males present in the collection is useful but is complicated by the fact that more than one species of *Brachypoda* may occur in the same locality, especially in eastern North America.

Two new species are described, the holotypes and allotypes of which will be placed in the Field Museum of Natural History (Chicago).

Key to the North American Species of *Brachypoda* (Based on Males Only)

1. A long ridge on each side extending far anterolaterally from the second pair of acetabula; posterior end of genital field distinctly set off from the ventral shield (fig. 6) ..... *B. cornipes* (two subspecies) 2
— Either no ridge or only a short ridge on each side extending anterolaterally from the second pair of acetabula; posterior end of genital field grading almost imperceptibly into the sclerotization of the ventral shield (fig. 8, 14, 15) 3
2. Body 685μ–700μ in length; longest claw on fourth leg 75μ–90μ in length ..... *B. cornipes cornipes* Habeeb
— Body 580μ–595μ in length; longest claw on fourth leg 54μ–60μ in length ..... *B. cornipes owascoa* Habeeb

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3. Lateral edges of genital field with many long setae, some of which extend beyond the posterior end of the cauda (fig. 14, 19, 20) 4
— Lateral edges of genital field with a few long setae, none of which extend to the posterior end of the cauda (fig. 8, 15) 6
4. A distinct ridge on each side extending between the outer edges of the most medial two pairs of acetabula (fig. 19, 20) 5
— No ridges extending between the outer edges of the most medial two pairs of acetabula ..... *B. setosicaudata* Habeeb
5. Anterior edge of genital field with a continuous row of small setae (fig. 20) ..... *B. fimbricaudata* Cook, n. sp.
— Anterior edge of genital field with a wide setae-free area (fig. 19) ..... *B. affinis* Cook, n. sp.
6. Cauda decidedly narrowed posteriorly (fig. 15) .... *B. acuticaudata* Habeeb
— Cauda only slightly narrowed posteriorly (fig. 8) .... *B. oakcreekensis* Habeeb

Brachypoda (Brachypoda) cornipes Habeeb
Fig. 1–7

Brachypoda cornipes Habeeb, 1956. Leaflets Acadian Biol., 12:1.

Male: Dorsal shield 506μ–586μ in length, 349μ–365μ in width; 2 pairs of greatly enlarged glandularia setae present laterally; stippled areas on fig. 3 illustrate dorsal color pattern; ventral shield 532μ–593μ in length, 365μ–395μ in width; first coxae projecting slightly beyond body; condyles associated with insertions of first legs apparent in ventral view; transverse ridge present immediately anterior to genital field and ridge present on each side extending far anterolaterally from region of second pair of acetabula; 3 pairs of acetabula, first and second pair located very close together; pair of lobed projections present between second and third acetabula (fig. 6); numerous small setae associated with genital field, those at posterior end bifurcate; width between outer edges of most lateral pair of acetabula 204μ–229μ.

Dorsal lengths of palpal segments: P-I, 35μ–38μ; P-II, 62μ–66μ; P-III, 42μ–45μ; P-IV, 93μ–100μ; P-V, 34μ–35μ; projection on ventral side of P-II relatively large; structure of palp similar to that of female (fig. 5) except P-IV bears numerous small setae; dorsal lengths of distal segments of fourth leg: IV-Leg-4, 118μ–128μ; IV-Leg-5, 164μ–186μ; IV-Leg-6, 150μ–173μ; IV-Leg-4 with long projection at distal end, this projection bearing 2 heavy setae at tip; 3 very heavy setae extending ventrally from IV-Leg-4; fig. 2 shows proportions and chaetotaxy of these segments; claws at tip of fourth leg without ventral clawlet; longest claw at tip of IV-Leg-6, 55μ–76μ in length; II-Leg-6 abruptly expanded at proximal end; III-Leg-6 only slightly longer than III-Leg-5.

Female: Dorsal shield (not including excretory pore platelet) 517μ–547μ in length, 358μ–395μ in width; excretory pore platelet 111μ–118μ in width; fig. 1 illustrates structure and color pattern of dorsal shield; length from anterior end of dorsal shield to posterior end of genital field 525μ–547μ; width 410μ–441μ; coxae not projecting; condyles associated with insertions of fourth legs may be seen in ventral view (fig. 7); 3 pairs of genital acetabula; width between outer edges of most lateral pair of acetabula 200μ–207μ.

Dorsal lengths of palpal segments: P-I, 34μ–35μ; P-II, 59μ–64μ; P-III, 39μ–42μ; P-IV, 82μ–89μ; P-V, 34μ–35μ; projection on ventral side of P-II well de-

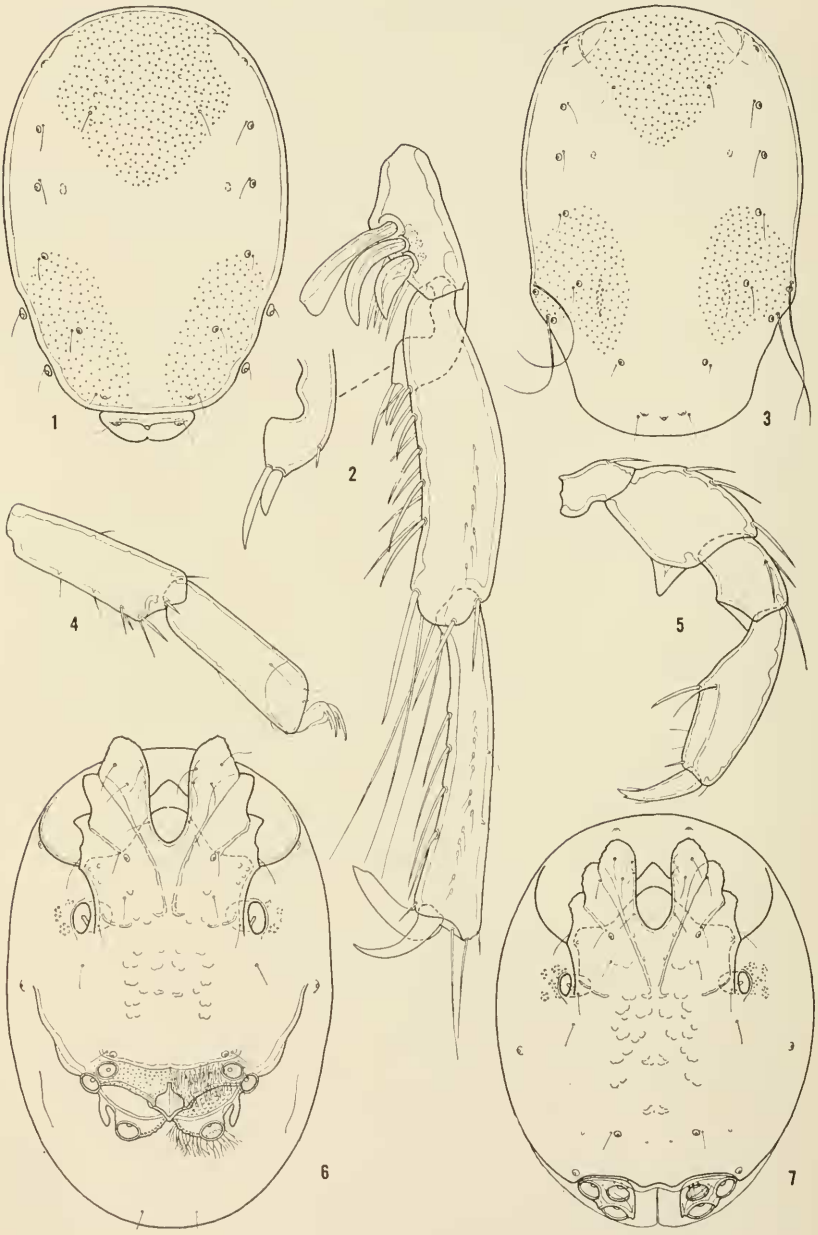

Fig. 1–7, *Brachypoda cornipes*. 1, dorsal shield, female. 2, distal segments of fourth leg, male. 3, dorsal shield, male. 4, I-Leg-5 and 6, female. 5, palp, female. 6, ventral shield, male. 7, ventral shield, female.

veloped; fig. 5 shows proportions and chaetotaxy of palp; dorsal lengths of distal segments of first leg: I-Leg-4, 72μ–79μ; I-Leg-5, 80μ–86μ; I-Leg-6, 80μ–86μ; fig. 4 shows I-Leg-5 and 6.

Material Examined: 9 ♂♂, 3 ♀♀, taken by stirring up bottom gravels in Black River on Road CC (north of Clear Water Reservoir), Reynolds Co., Missouri, June 21, 1967; 1 ♂, 1 ♀, taken in Flatbrook south of Bevans, Sussex Co., New Jersey, Sept. 7, 1968; 1 ♀, taken by stirring up bottom gravels in Thompson Creek near McClung, Bath Co., Virginia, Sept. 9, 1968; 4 ♂♂, from bottom deposits in tributary of Jackson River near Bacova, Bath Co., Virginia, Sept. 9, 1968; 1 ♂, 2 ♀♀, from South Branch of Umpqua River near Milo, Douglas Co., Oregon, Aug. 11, 1961.

Discussion: The original description of *cornipes* is so general as to be nearly useless and it includes only a very diagrammatic drawing of the male fourth leg. Thus, in the absence of type or topotypic material, identification of the present species with *cornipes* should be regarded as tentative. However, there is nothing in the original description and drawing which would suggest they are not conspecific. The type locality is a brook in Victoria Co., New Brunswick. Habeeb (1966) described a subspecies, *cornipes owascoa*, from Dutch Hollow Creek in Cayuga Co., New York, stating the latter was smaller and had much shorter claws on the male fourth leg. Habeeb gives a body length of 685μ–700μ for the typical subspecies, 580μ–595μ for *owascoa*. The claws of the fourth leg had a length of 75μ–90μ in *cornipes cornipes*, and a length of 54μ–60μ in the subspecies from New York. All material in the present study falls within the size variation expected in *owascoa*. My specimens from Oregon lack the distinctive color pattern found in the eastern representatives (fig. 1, 3) but otherwise seem similar.

Brachypoda (Ocybrachypoda) oakcreekensis Habeeb, new status
Fig. 8–13

Brachypoda acuticaudata oakcreekensis Habeeb, 1961. Leaflets Acadian Biol., 24:2.

Male: Dorsal shield 494μ–585μ in length, 350μ–410μ in width; no setae on dorsal shield greatly enlarged; ventral shield 486μ–592μ in length, 380μ–441μ in width; first coxae not projecting beyond end of body; condyles associated with insertions of fourth legs not visible in ventral view; indistinct ridge present immediately anterior to genital field; no ridges extending anterolaterally from most lateral pair of acetabula; 3 pairs of genital acetabula; width between outer edges of most lateral pair of acetabula 214μ–266μ; typically with 4 pairs of long setae flanking genital field, these not extending to posterior end of body (fig. 8); posterior end of body (cauda) only slightly narrowed laterally; degree of sclerotization of posterolateral edges of ventral shield variable producing slight indentations in cauda in some specimens.

Dorsal lengths of palpal segments: P-I, 32–36μ; P-II, 59μ–66μ; P-III, 34μ–37μ;

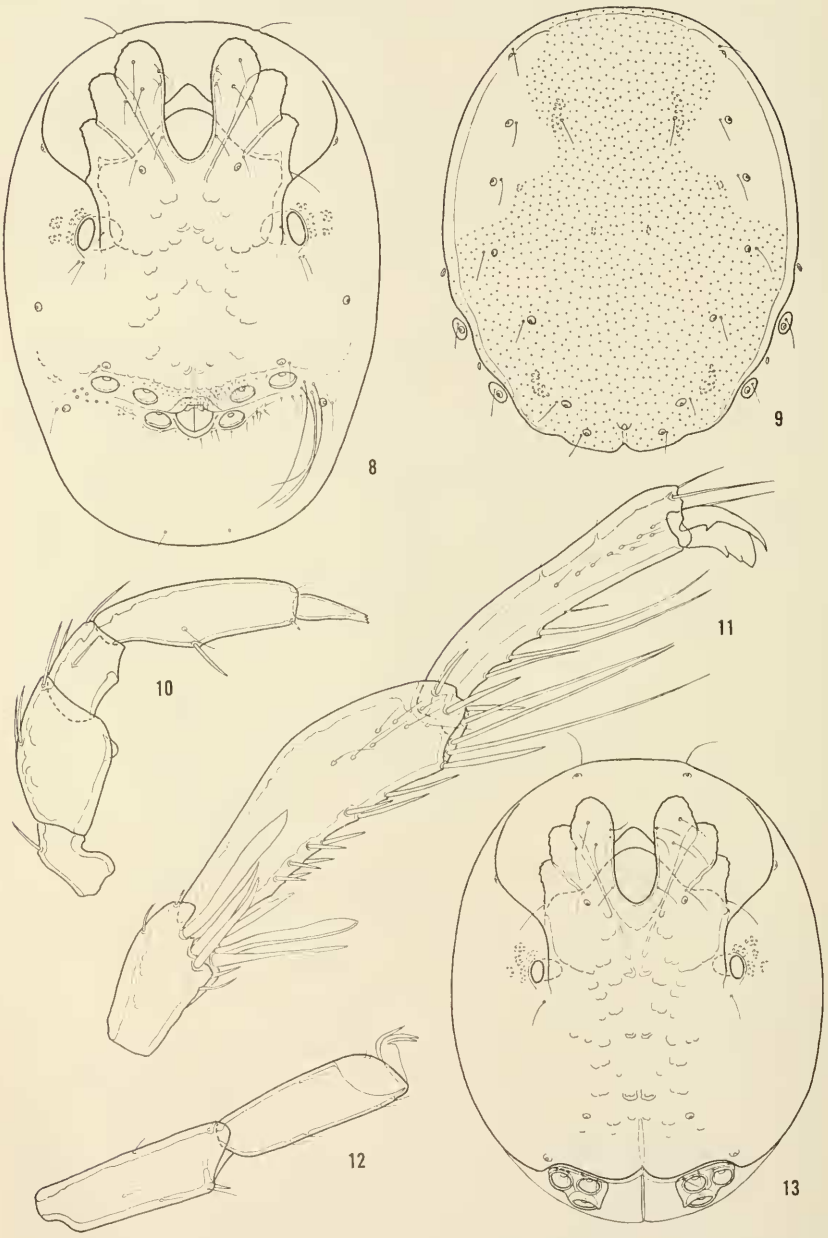

Fig. 8–13, *Brachypoda oakcreekensis*. 8, ventral shield, male. 9, dorsal shield, female. 10, palp, female. 11, distal segments of fourth leg, male. 12, I-Leg-5 and 6, female. 13, ventral shield, female.

P-IV, 84μ–98μ; P-V, 31μ–34μ; projection on ventral side of P-II moderately developed; structure of palp similar to that shown for female except surface of P-IV bears numerous small setae; capitulum 124μ–135μ in length, chelicera 118μ–131μ in length; dorsal lengths of distal segments of fourth leg: IV-Leg-4, 66μ–83μ; IV-Leg-5, 159μ–190μ; IV-Leg-6, 149μ–169μ; most distal of 2 long setae on ventral side of IV-Leg-6 located near middle of segment; fig. 11 shows specialized chaetotaxy of IV-Leg-4; 1 claw of fourth leg with ventral clawlet.

Female: Dorsal shield 502μ–608μ in length, 395μ–412μ in width; excretory pore platelet fused with dorsal shield (fig. 9); length from anterior end of ventral shield to posterior end of genital field 517μ–592μ, width 426μ–456μ; coxae not projecting to anterior end of body; condyles associated with insertions of fourth legs not visible in ventral view (fig. 13); 3 pairs of genital acetabula; width between outer edges of most lateral pair of acetabula 211μ–222μ.

Dorsal lengths of palpal segments: P-I, 35μ–38μ; P-II, 62μ–69μ; P-III, 35μ–38μ; P-IV, 85μ–96μ; P-V, 34μ–36μ; projection on ventral side of P-II moderately developed; fig. 10 shows proportions and chaetotaxy of palp; capitulum 130μ–141μ in length, chelicera 128μ–131μ in length; dorsal lengths of distal segments of first leg: I-Leg-4, 71μ–76μ; I-Leg-5, 83μ–90μ; I-Leg-6, 76μ–83μ; fig. 12 illustrates I-Leg-5 and 6.

Material Examined: 3 ♂♂, 13 ♀♀, taken in Oak Creek in Oak Creek Canyon (type-locality), Coconino Co., Arizona, Oct. 24, 1970; 22 ♂♂, 21 ♀♀, taken in Little Creek on Highway 15 near Gila Cliff Dwellings National Monument, Catron Co., New Mexico, Oct. 21, 1970; 1 ♂, 1 ♀, taken in Moccasin Creek, Tuolumne Co., California, Oct. 26, 1970; 5 ♂♂, 3 ♀♀, from South Fork of Trinity River, Trinity Co., California, July 30, 1966; 1 ♂, 1 ♀ collected in Gibbon River above Virginia Cascades, Yellowstone National Park, Wyoming, Sept. 1, 1961.

Discussion: *Brachypoda oakcreekensis* and all of the remaining species are assigned to the subgenus *Ocybrachypoda*, the latter erected by Cook (1974). This subgenus is predominantly a North American group but the European species *B. celeripes* Viets is also included. The original description of *oakcreekensis* is inadequate and lacking in illustrations. However, there apparently is only one species present in the type locality and identification therefore seems reasonably certain. The most distinctive feature of the present species is the fusion of the excretory pore platelet with the dorsal shield in the female (fig. 9). In females of all other species of *Brachypoda*, this platelet (fig. 21) is separate. The largest measurements given are from the individuals collected in Yellowstone National Park. Specimens from the type locality are nearer the low end of the size range.

Brachypoda (Ocybrachypoda) setosicaudata Habeeb
Fig. 14, 17

Brachypoda setosicaudata Habeeb, 1953. Leaflets Acadian Biol., 1:12.

Male: Dorsal shield 646μ–714μ in length, 441μ–458μ in width; no setae of dorsal shield greatly enlarged; ventral shield 638μ–745μ in length, 456μ–516μ

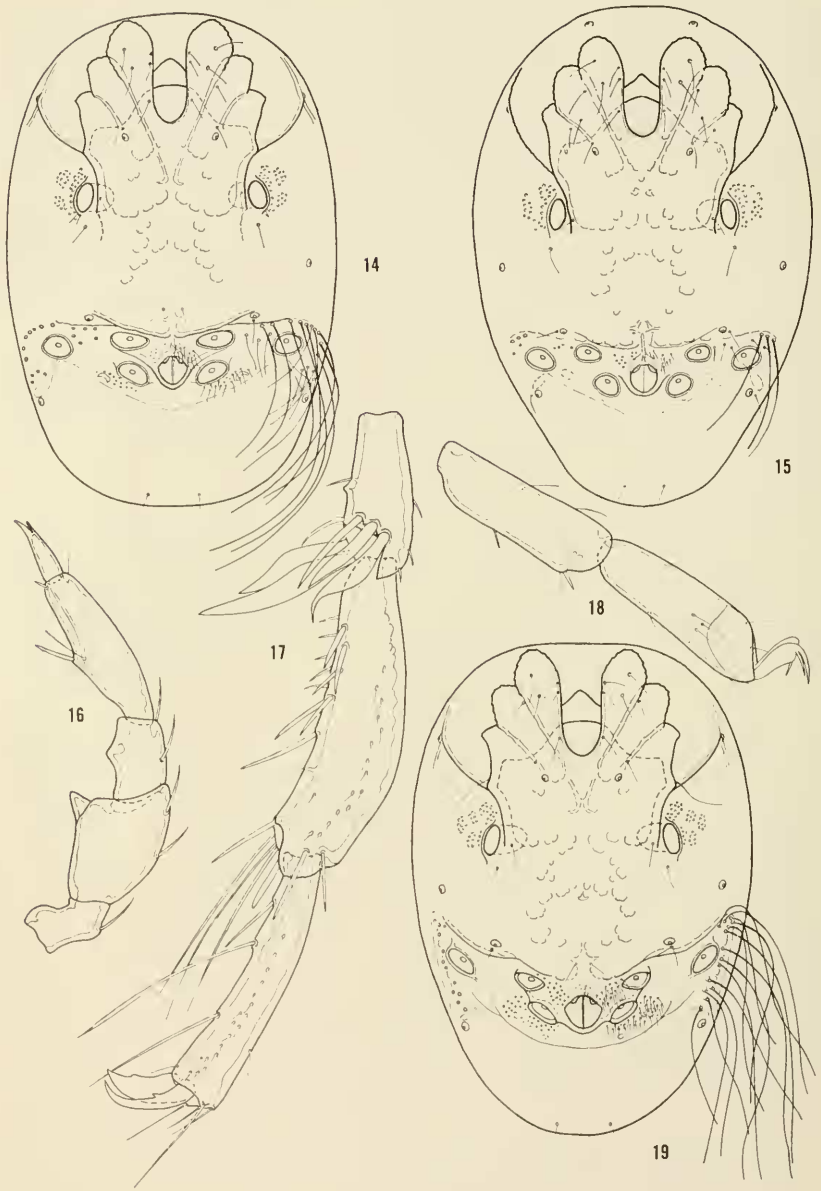

Fig. 14–19, *Brachypoda* spp. 14, *B. setosicaudata*, ventral shield, male. 15, *B. acuticaudata*, ventral shield, male. 16, *B. affinis*, palp, female. 17, *B. setosicaudata*, distal segments of fourth leg, male. 18, *B. affinis*, I-Leg-5 and 6, female. 19, *B. affinis*, ventral shield, male.

in width; first coxae extending nearly to anterior end of body; condyles associated with insertions of fourth legs not visible in ventral view; well developed ridge present immediately anterior to genital field which extends to associated pair of glandularia and indistinct ridge on each side extending to area of most lateral glandularia; 3 pairs of genital acetabula; width between outer edges of most lateral pair of acetabula 348μ–362μ; indistinct ridge on each side extending from gonopore to first pair of acetabula; numerous long setae present in lateral portions of genital field, some of which extend well beyond posterior end of canda (fig. 14); posterior end of body somewhat truncate and only slightly narrowed.

Dorsal lengths of palpal segments: P-I, 38μ–42μ; P-II, 69μ–73μ; P-III, 44μ–48μ; P-IV, 116μ–126μ; P-V, 35μ–38μ; projection on ventral side of P-II well developed; surface of P-IV with numerous small setae; capitulum 149μ–156μ in length, chelicera 142μ–145μ in length; dorsal lengths of distal segments of fourth leg: IV-Leg-4, 97μ–104μ; IV-Leg-5, 196μ–214μ; IV-Leg-6, 177μ–189μ; most distal of 2 long setae on ventral side of IV-Leg-6 located near distal end of segment; fig. 11 shows specialized setae of IV-Leg-4; 1 claw of fourth leg with ventral clawlet.

Female: Dorsal shield (not including the excretory pore platelet) 577μ–668μ in length, 440μ–486μ in width; excretory pore platelet free and 126μ–155μ in width; length from anterior end of ventral shield to posterior end of genital field 608μ–707μ, width 486μ–547μ; coxae not extending to anterior end of body; condyles associated with insertions of fourth legs not visible in ventral view; 3 pairs of genital acetabula; width between outer edges of most lateral pair of acetabula 266μ–295μ.

Dorsal lengths of palpal segments: P-I, 38μ–39μ; P-II, 64μ–66μ; P-III, 42μ–44μ; P-IV, 97μ–107μ; P-V, 33μ–36μ; dorsal lengths of distal segments of first leg: I-Leg-4, 80μ–93μ; I-Leg-5, 87μ–100μ; I-Leg-6, 96μ–101μ.

Material Examined: 2 ♂♂, 18 ♀♀, collected in Adam's Creek approximately 5 miles east of Mesick, Wexford Co., Michigan, July 13, 1959; 1 ♂, 3 ♀, taken in Miner River immediately above Miner's Falls, Alger Co., Michigan, Aug. 27, 1959; 1 ♂, from Duck Creek 1 mile south of Watersmeet, Gogebic Co., Michigan, Aug. 14, 1960; 1 ♂, 1 ♀, from Jardine Brook 10 miles southwest of St. Quentin, Victoria Co., New Brunswick, Aug. 27, 1964; 2 ♂♂, 1 ♀, taken in headwaters of Grand River, Victoria Co., New Brunswick, Sept. 3, 1968; 1 ♂, from stream in Howard Co., Maryland, Nov. 1952.

Discussion: The long setae flanking the genital field, only slightly narrowed posterior end of the body and lack of distinct ridges extending between the outer edges of the most medial two pairs of acetabula is diagnostic for males of the present species. Females of *setosicaudata* and the following species are very similar and can be distinguished with certainty only by association with the male. As mentioned in the introduction, this association is complicated by the possible occurrence of two or more species of *Brachypoda* in the same area, especially in eastern North America. Measurements are given for the female but the possibility exists that the series contained a mixture of species. The female venter is similar to that shown in fig. 13 but the dorsal shield resembles that illustrated in fig. 21.

Brachypoda (Ocybrachypoda) acuticaudata Habeeb
Fig. 15

Brachypoda setosicaudata acuticaudata Habeeb, 1953. Leaflets Acadian Biol. 1:12.
Brachypoda acuticaudata Habeeb, 1961. *op. cit.*, 24:2.

Male: Dorsal shield 586μ–638μ in length, 395μ–426μ in width; no setae of dorsal shield greatly enlarged; ventral shield 593μ–662μ in length, 425μ–471μ in width; first coxae not extending to anterior end of body; condyles associated with insertions of fourth legs not visible in ventral view; moderately developed ridge present immediately anterior to genital field; 3 pairs of genital acetabula, most posterior pair of which are closest to gonopore; width between outer edges of most lateral pair of acetabula 288μ–314μ; typically with 3 pairs of long setae present in lateral portion of genital field, but these not extending to posterior end of body (fig. 15); cauda decidedly narrowed posteriorly.

Dorsal lengths of palpal segments: P-I, 35μ–38μ; P-II, 61μ–66μ; P-III, 39μ–43μ; P-IV, 104μ–111μ; P-V, 31μ–34μ; projection on ventral side of P-II well developed; surface of P-IV with numerous small setae; capitulum 148μ–155μ in length, chelicera 142μ–145μ in length; dorsal lengths of distal segments of fourth leg: IV-Leg-4, 80μ–89μ; IV-Leg-5, 176μ–190μ; IV-Leg-6, 155μ–161μ; chaetotaxy of these segments as described and illustrated for preceding species (fig. 17).

Female: Similar to that of *setosicaudata* but averaging somewhat smaller. However, larger individuals of *acuticaudata* are larger than smaller specimens of the former, and therefore a female unassociated with the male cannot always be identified with certainty. Individuals, apparently belonging to the present species, had a dorsal shield length (not including the excretory pore platelet) of 547μ–608μ.

Material Examined: 1 ♂, 2 ♀♀, from Little Wapskehegan River east of Plaster Rock, Victoria Co., New Brunswick, Sept. 5, 1968; 1 ♂, collected in stream flowing into St. Froid Lake (near the town of Eagle Lake), Aroostook Co., Maine, Sept. 3, 1968; 12 ♂♂, 5 ♀♀, from Flatbrook south of Bevans, Sussex Co., New Jersey, Sept. 7, 1968.

Discussion: The present species seems most closely related to *B. setosicaudata*. It differs in its narrowed cauda and fewer and shorter setae flanking the genital field (compare fig. 14, 15). The male of *acuticaudata* somewhat resembles the western species, *B. oakcreekensis*, but the latter has a much less narrowed cauda. Females of these latter two species are very distinctive for the excretory pore platelet of *oakcreekensis* is fused with the dorsal shield.

Brachypoda (Ocybrachypoda) fimbricaudata Cook, new species
Fig. 20–25

Male: Dorsal shield 608μ in length, 395μ in width; no setae of dorsal shield greatly enlarged (fig. 25); ventral shield 616μ in length, 425μ in width; first coxae not extending to anterior end of body; condyles associated with insertions of fourth legs not visible in ventral view; well developed ridge present immediately anterior to genital field; 3 pairs of genital acetabula; width between outer edges of most lateral pair of acetabula 311μ; short ridge present on each side extending

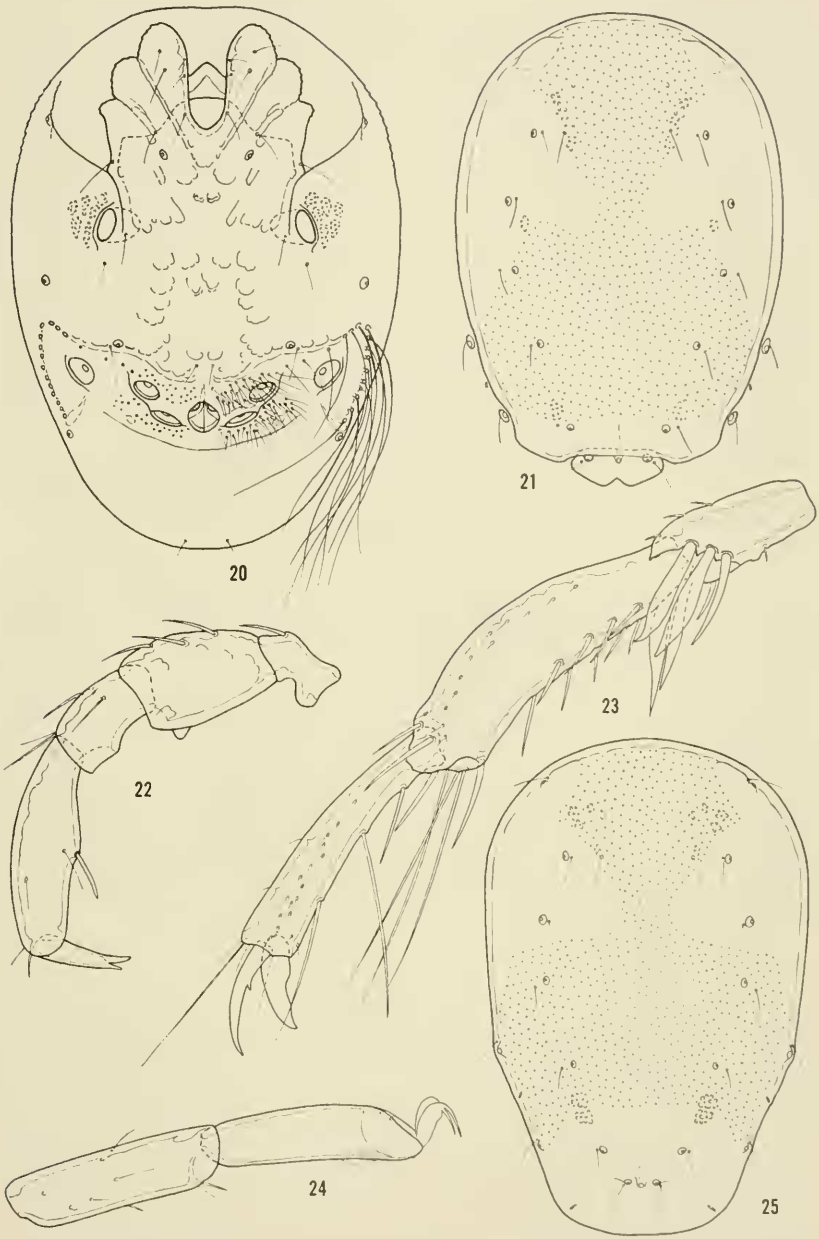

Fig. 20–25, *Brachypoda fimbricaudata*. 20, ventral shield, male. 21, dorsal shield, female. 22, palp, female. 23, distal segments of fourth leg, male. 24, I-Leg-5 and 6, female. 25, dorsal shield, male.

between outer edges of most medial 2 pairs of acetabula (fig. 20); numerous long setae present lateral to genital field, several of which extend well beyond posterior end of cauda; several shorter setae forming continuous row slightly anterior to acetabula; posterior end of body somewhat narrowed.

Dorsal lengths of palpal segments: P-I, 36μ; P-II, 59μ; P-III, 39μ; P-IV, 100μ; P-V, 33μ; projection on ventral side of P-II moderately developed; surface of P-IV with numerous small setae; capitulum 136μ in length, chelicera 131μ in length; dorsal lengths of distal segments of fourth leg: IV-Leg-4, 88μ; IV-Leg-5, 190μ; IV-Leg-6, 156μ; most distal of 2 long setae on ventral side of IV-Leg-6 located near distal end; fig. 23 illustrates proportions and chaetotaxy of these segments; 1 claw at tip of fourth leg with ventral clawlet.

Female: Dorsal shield (excluding excretory pore platelet) 623μ in length, 462μ in width; excretory pore platelet free and 126μ in width; length from anterior end of ventral shield to posterior end of genital field 638μ, width 517μ; coxae not extending to anterior end of body; condyles associated with insertions of fourth legs not visible in ventral view; 3 pairs of genital acetabula; width between outer edges of most lateral pair of acetabula 281μ.

Dorsal lengths of palpal segments: P-I, 38μ; P-II, 64μ; P-III, 44μ; P-IV, 101μ; P-V, 35μ; fig. 22 illustrates structure of palp; capitulum 145μ in length, chelicera 131μ in length; dorsal lengths of distal segments of first leg: I-Leg-4, 80μ; I-Leg-5, 97μ; I-Leg-6, 93μ; fig. 24 shows I-Leg-5 and 6.

Holotype: Adult ♂, collected from mosses on a rock in a mountain stream at Pine Grove Furnace State Park, Cumberland Co., Pennsylvania, May 21, 1961.

Allotype: Adult ♀, same data as holotype.

Discussion: The present species is most closely related to the following species (see remarks under the latter). Both differ from all other known species of *Brachypoda* in having a very pronounced ridge on each side extending along the outer edges of the two most medial pair of acetabula in the male (fig. 19, 20). *Brachypoda fimbricaudata* differs from the following species in that the setae of the male genital field extend completely across the area anterior to the acetabula.

Brachypoda (Ocybrachypoda) affinis Cook, new species

Fig. 16, 18, 19

Male: (Measurements of holotype are given first, range of variation of type-series is given in parentheses); dorsal shield 562μ (547μ–577μ) in length, 380μ (350μ–380μ) in width; no setae of dorsal shield greatly enlarged; ventral shield 570μ (555μ–593μ) in length, 414μ (379μ–414μ) in width; first coxae projecting nearly to anterior end of body; condyles associated with insertions of fourth legs not visible in ventral view; well-developed ridge present immediately anterior to genital field; 3 pairs of genital acetabula; width between outer edges of most lateral pair of acetabula 326μ (296μ–326μ); short ridge present on each side extending between outer edges of most medial 2 pairs of acetabula; numerous long setae present lateral to genital field, several of which extend well beyond posterior end of cauda; setae-free area extending along anterior edge of genital field (fig. 19); posterior end of body somewhat narrowed.

Dorsal lengths of palpal segments: P-I, 35μ (35μ–38μ); P-II, 57μ (55μ–59μ); P-III, 41μ (40μ–44μ); P-IV, 93μ (92μ–100μ); P-V, 33μ (31μ–34μ); projection on ventral side of P-II varying from moderately to well developed; numerous small setae present on surface of P-IV; capitulum 124μ (121μ–128μ) in length, chelicera 118μ (117μ–125μ) in length; dorsal lengths of distal segments of fourth leg: IV-Leg-4, 83μ (76μ–86μ); IV-Leg-5, 180μ (173μ–183μ); IV-Leg-6, 149μ (144μ–156μ); structure of these segments similar to those described and illustrated for *B. fimbricaudata* (fig. 23).

Female (?): Dorsal shield (not including excretory pore platelet) 470μ in length, 364μ in width; excretory pore platelet 96μ in width; length from anterior end of ventral shield to posterior end of genital field 502μ, width 425μ; coxae not extending to anterior end of body; condyles associated with insertions of fourth legs not visible in ventral view; 3 pairs of genital acetabula; width between outer edges of most lateral pair of acetabula 204μ.

Dorsal lengths of palpal segments: P-I, 31μ; P-II, 52μ; P-III, 38μ; P-IV, 78μ; P-V, 31μ; fig. 16 illustrates proportions and chaetotaxy of palp; capitulum 118μ in length, chelicera 116μ in length; dorsal lengths of distal segments of first leg: I-Leg-4, 66μ; I-Leg-5, 73μ; I-Leg-6, 76μ; fig. 18 shows I-Leg-5 and 6.

Holotype: Adult ♂, taken by stirring up bottom gravels in Simpson Creek approximately 6 miles east of Cowpasture River, Alleghany Co., Virginia, Sept. 9, 1968.

Paratypes: 5 ♂♂, same data as holotype.

Discussion: The single female specimen is so noticeably smaller than the males that it is not certain they actually are conspecific. However, no other species (based on males) is known from the type locality, and color pattern and structure (other than size) are as would be expected for the female of *affinis*. The present species is most closely related to *B. fimbricaudata*. Males of *affinis* differ in being somewhat smaller and bearing a wide setae-free area at the anterior end of the genital field (compare fig. 19, 20). If the female specimen actually is conspecific, it differs from *fimbricaudata* in proportions of the leg segments (compare fig. 18, 24) as well as in body size.

References

Cook, D. 1974. Water mite genera and subgenera. Mem. Amer. Entomol. Inst., no. 21. 860 p.

Habeeb, H. 1966. New Hydrachnellae from the vicinity of Auburn, New York. Leaflets Acadian Biol., 41:1–8.

NEW SYNONYMY IN THE NEARCTIC ANTHICIDAE (COLEOPTERA)[1]

Floyd G. Werner
Department of Entomology, University of Arizona, Tucson 85721

I have used the following synonymies in identification for some time but have never validated them formally. I am presenting them here in order to make them available for use in the proposed new catalog of Nearctic Coleoptera.

Amblyderus granularis (LeConte)
Anthicus granularis LeConte, 1850:231.
Amblyderus punctiger Casey, 1895:747. NEW SYNONYMY.
Amblyderus obesus Casey, 1895:743.
Amblyderus albicans Casey, 1895:744. NEW SYNONYMY.
Amblyderus pallens (LeConte)
Anthicus pallens LeConte, 1850:231.
Amblyderus arenarius Casey, 1895:748. NEW SYNONYMY.
Amblyderus parviceps Casey, 1895:744.
Amblyderus gracilentus Casey, 1895:745. NEW SYNONYMY.
Anthicus punctulatus LeConte, 1851:155.
Anthicus mercurialis Casey, 1895:707. NEW SYNONYMY.
Malporus formicarius (LaFerté)
Anthicus formicarius LaFerté, 1848:185.
Malporus blandus Casey, 1895:654. NEW SYNONYMY.
Thicanus texanus (LaFerté)
Anthicus texanus LaFerté, 1848:301.
Anthicus reiectus LeConte, 1852:97. NEW SYNONYMY.

References

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LaFerté-Sénectère, F. T. de. 1848. Monographie des *Anthicus*. . . . Sapia, Paris. *xxii* + 340 p.

LeConte, J. L. 1850. General remarks upon the Coleoptera of Lake Superior. *IN:* Agassiz, J. L. R. Lake Superior. . . . Gould, Kendall and Lincoln, Boston. *x* + 428 p.

————. 1851. Descriptions of new species of Coleoptera, from California. Ann. Lyc. Nat. Hist. New York. 5:125–184 (1851), 185–216 (1852).

————. 1852. Synopsis of the anthicites of the United States. Proc. Acad. Nat. Sci. Phila. 6:91–104.

[1] Journal Paper no. 2278 of the Arizona Agricultural Experiment Station.

NOTES ON THE STATUS AND RELATIONSHIPS OF SOME GENERA IN THE TRIBE MILESIINI (DIPTERA: SYRPHIDAE)

F. Christian Thompson
Systematic Entomology Laboratory, IIBIII, Agr. Res. Serv., USDA[1]

ABSTRACT—The taxonomic status and the phylogenetic relationships of certain genera in the tribe Milesiini (Diptera: Syrphidae) are discussed. *Lejota* Rondani, *Chalcosyrphus* Curran, and *Cynorhinella* Curran are transferred from the tribe Myoleptini to the tribe Milesiini. *Xylotodes* Shannon, *Cheiroxylota* Hull, and *Neplas* Porter are synonymized with *Chalcosyrphus* (*Xylotomima* Shannon). The following are reduced to subgeneric status: *Chrysosomidia* Curran as a subgenus of *Hadromyia* Williston, *Crioprora* Osten Sacken as a subgenus of *Brachypalpus* Macquart, and *Xylotomima* Shannon as a subgenus of *Chalcosyrphus* Curran.

The status and relationships of a number of genera in the tribe Milesiini of the subfamily Eristalinae (= Milesiinae) have been confused. For the forthcoming Manual of North American Diptera a new arrangement of these genera will be used. To avoid further confusion and uncertainty about these taxa, the reasons for the new arrangement and the changes involved are here briefly explained.

The taxa treated are first listed synonymically[2], then they are discussed individually and in alphabetical order, followed by a key summarizing the diagnostic characters of the valid genera and subgenera. A complete key to the Nearctic syrphid genera will be included in the forthcoming North American Diptera Manual. The male genitalia of the type-species of all the discussed taxa are figured.

Synonymical List of Taxa Mentioned in This Paper

Tribe Brachyopini Williston, 1885

Myolepta Newman, 1838, Entomol. Mag. (Newman's) 5:373. Type-species, *Musca luteola* Gmelin (mono.). See Thompson (1974) for detailed synonymy and discussion of phylogenetic relationships.

Tribe Milesiini Rondani, 1845

The *Blera* Group

Blera Billberg, 1820, Enum. Insect. in Mus. Blbg:118. Type-species, *Musca fallax* Linnaeus (Johnson, 1911, Psyche. 18:73). See Wirth, *et al.* (1965:610) for synonyms.

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[1] Mail address: c/o U.S. National Museum, NHB-168, Washington, D.C. 20560.
[2] The format used follows that of the North American Diptera Catalog (c. Wirth, *et al.*, 1965). The type-species for replacement names have not been repeated because they are the same as those of the original names. A complete list of the eristaline genera can be found in Thompson (1972:202–207).

Caliprobola Rondani, 1845, Nouv. Ann. Sci. Nat. Bologna (2)2:455. Type-species, *Syrphus speciosa* Rossi (as *Milesia speciosa* Fabr.) (orig. des.)

Lejota Rondani, 1857, Dipt. Ital. Prodr. 2:176. Type-species, *Psilota ruficornis* Zetterstedt (Goffe, 1944, Entomol. Mon. Mag. 80:29). See Wirth, *et al.* (1965:590) for synonyms.

The *Tropidia* Group

Cynorhinella Curran, 1922, Can. Entomol. 54:14. Type-species, *canadensis* Curran (orig. des.). See Wirth, *et al.* (1965:588) for synonyms.

The *Xylota* Group

Brachypalpus Macquart, 1834, (Roret's Suite a Buffon), Dipt. 1:523 (Hist. Nat. Ins., Dipt. 1:523). Type-species, *tuberculatus* Macquart (Rondani, 1844, Nouv. Ann. Sci. Nat. Bologna (2)2:456) = *Syrphus valgus* Panzer.

Subg. *Crioprora* Osten Sacken, 1878, Catal. Descr. Dipt. N. Amer., 2nd. ed.: 136, 251. Type-species, *Pocota alopex* Osten Sacken (Williston, 1887, Bull. U. S. Natn. Mus. [1886] 31:217). NEW STATUS

Chalcosyrphus Curran, 1925, Kan. Univ. Sci. Bull. [1924] 15:122 (as a subgenus of *Chalcomyia*). Type-species, *atra* Curran (orig. des.) = *Chalcomyia depressa* Shannon.

Subg. *Xylotomima* Shannon, 1926, Proc. U. S. Natn. Mus. 69(9):7, 15. Type-species, *Xylota vecors* Osten Sacken (orig. des.). As first revisor I select *Xylotomima* as being senior to *Xylotodes*. NEW STATUS

Planes Rondani, 1863, Dipt. Exot. Rev. Annot.:9 (preocc. Bowdich, 1825; Saussure, 1862). Type-species, *Xylota vagans* Wiedemann (mono.).

Xylotodes Shannon, 1926, Proc. U. S. Natn. Mus. 69(9):7, 22. Type-species, *Brachypalpus inarmatus* Hunter (orig. des.). NEW SYNONYMY

Neplas Porter, 1927, Revta chil. Hist. Nat. 31:96. New name for *Planes* Rondani. NEW SYNONYMY

Cheiroxylota Hull, 1949, Trans. Zool. Soc. London. 26:361. Type-species, *Xylota dimidiata* Brunetti (orig. des.). NEW SYNONYMY

Hadromyia Williston, 1882, Can. Entomol. 14:78. Type-species, *grandis* Williston (mono.).

Subg. *Chrysosomidia* Curran, 1934, Man. Fam. Gen. N. Amer. Dipt., 2nd ed.:261. Type-species, *Caliprobola crawfordi* Shannon (orig. des.). NEW STATUS

Macrometopia Philippi, 1865, Verh. Zool.-Bot. Ges. Wien 15 (abh.):740. Type-species, *atra* Philippi (mono.). See Thompson (1972:152) for redescription.

Pocota Lepeletier and Serville, 1828, Ency. Meth. (Ins.) 10(2):518 (as a subgenus of *Milesia*). Type-species, *Milesia apicata* Meigen (mono.) = *Musca apiformis* Schrank.

Xylota Meigen, 1822, Syst. Beschr. Zweifl. Ins. 3:211. Unjustified new name for *Heliophilus* Meigen. See Wirth, *et al.* (1965:604) for detailed synonymy and reasons for use of *Xylota*.

Heliophilus Meigen, 1803, Mag. Insektenk. (Illiger). 2:273. Type-species, *Musca sylvarum* Linnaeus (mono.).

Generic Discussions

Blera Billberg (fig. 30–33): Both *Blera* (fig. 32–33) and *Somula* (fig. 29) share the basal elongation of the aedeagus and its fusion

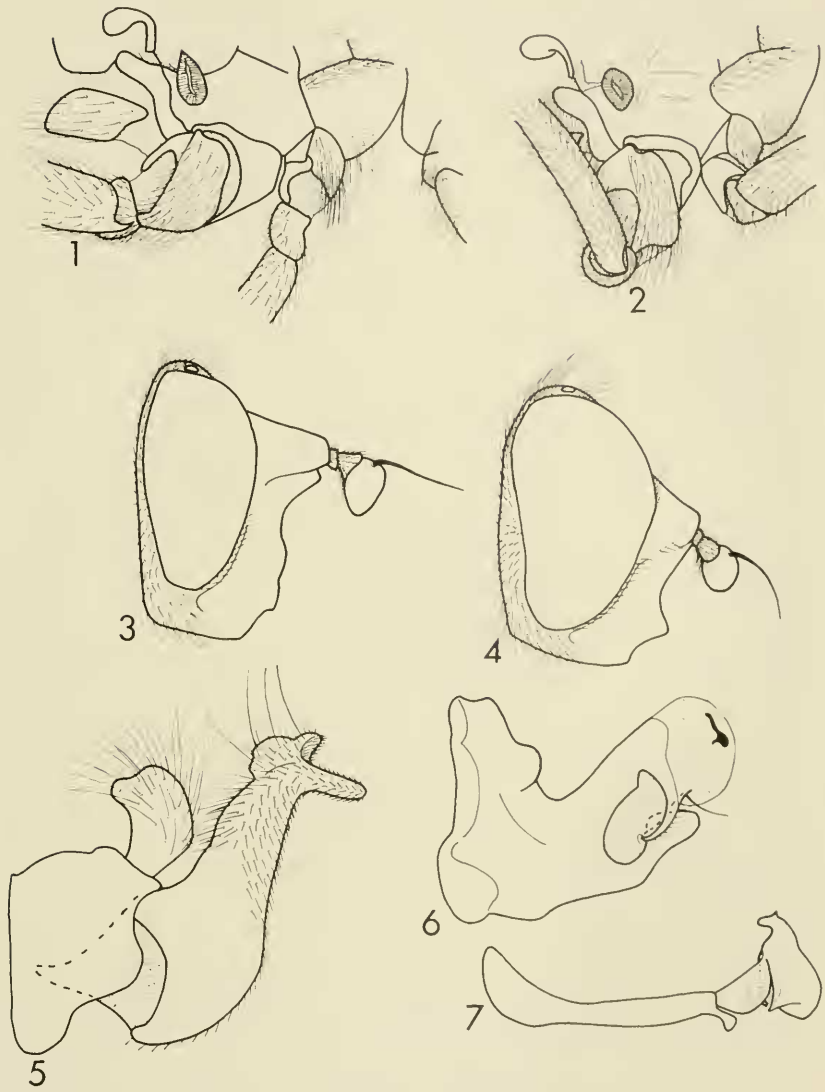

Fig. 1–2. Metasterna and associated structures, lateral view. 1, *Hadromyia* (*Chrysosomidia*) *pulcher* (Williston). 2, *Caliprobola speciosa* (Rossi). Fig. 3–4. Heads, lateral view. 3, *Caliprobola speciosa* (Rossi). 4, *Hadromyia* (*Chrysosomidia*) *pulcher* (Williston). Fig. 5–7. Male genitalia of *Caliprobola speciosa* (Rossi), lateral view. 5, 9th tergum. 6, 9th sternum. 7, aedeagus.